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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): S. TANAKA, et al

Serial No.: 10/073,029

Filed: February 12, 2002

For: DIRECT-CONVERSION TRANSMITTING CIRCUIT AND  
INTEGRATED TRANSMITTING/RECEIVING CIRCUIT

Group: 2816

Examiner:

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR 1.97 & 1.98**

Mail Stop DD  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

May 28, 2003

Sir:

In the matter of the above-identified application, applicant(s) is/are submitting herewith a copy of a communication from a foreign patent office in a counterpart foreign application and copies of the documents listed in the attached form equivalent to Form PTO-1449 for the Examiner's consideration.

This information disclosure statement is being submitted before the mailing date of a first office action on the merits and with the following certification specified in 37 CFR 1.97(e).

On information and belief, I hereby certify that each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not than more than three months prior to the filing of this statement.

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Each of the documents listed on the attached form equivalent to Form PTO-1449 is in the English language.

It is respectfully requested that this information disclosure statement be considered by the Examiner.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (843.41127X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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Form PTO-1449  
Equivalent

U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No. 843.41127X00  
Serial No. 10/073,029  
Applicant: S. TANAKA, et al  
Filing Date: February 12, 2002  
Group: 2816



U.S. Patent Documents

Examiner Initials	Document No.	Date	Name	Class Subclass	Filing Date If Approp
	3,501,709	3/70	Utrecht		
	5,990,738	11/99	Wright et al		
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Foreign Patent Documents

Document No.	Date	Country	Class Subclass	Translation Yes No
0 274 784 A1	7/88	European		
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Other Documents (including Author, Title, Date, Pertinent Pages, etc.)

Examiner

Date Considered

\*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609;  
Draw line through citation if not in conformance and not considered. Include copy of this form with next  
communication to applicant.



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RECORDS ENT'D.....  
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DIARY ENT'D.....  
RENEWAL ENT'D X.....  
ALREADY ENT'D.....

Datum/Date  
06.03.03

Zeichen/Ref./Réf.  
TRC/FP5985973

Anmeldung Nr./Application No./Demande n°./Patent Nr./Patent No./Brevet n°.  
02250529.1-2215-

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire  
Hitachi Ltd., et al

## COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

abstract

title

The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract:

11

## REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.



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DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages		
A	EP 1 102 413 A (HITACHI LTD) 23 May 2001 (2001-05-23) * figures 1,16 * ----	1,2,8-10	H03C3/40
A	US 5 990 738 A (WRIGHT ANDREW S ET AL) 23 November 1999 (1999-11-23) * column 10, line 5 – line 39; figure 26 * ----	1	
A	EP 0 865 165 A (TOKYO SHIBAURA ELECTRIC CO) 16 September 1998 (1998-09-16) * column 18, line 5 – column 19, line 19; figure 11 * ----	1	
A	US 3 501 709 A (UETRECHT DALE M) 17 March 1970 (1970-03-17) * figure 4 * ----	3-5	
A	EP 0 274 784 A (PHILIPS NV) 20 July 1988 (1988-07-20) * figure 1 * ----	3-5	
A	US 6 021 323 A (VAGHER MICHAEL R) 1 February 2000 (2000-02-01) * figure 3 * -----	6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H03C
The present search report has been drawn up for all claims			
2	Place of search  THE HAGUE	Date of completion of the search  18 February 2003	Examiner  Peeters, M
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or  after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding  document</p>	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 0529

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-02-2003

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## ABSTRACT / ZUSAMMENFASSUNG / ABREGE

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A three band GSM (800MHz, 1800MHz, 1900MHz) transmitter/receiver comprises direct conversion mixers and one RF PLL synthesiser with a VCO. In order to reduce DC-offset, to reduce the number of parts and to achieve noise reduction in the receiving band, low-pass filters (130 and 131) are provided at IQ input sections of a modulator (106) that converts IQ signals into RF signals.

In comparison with a conventional transmitter using an offset PLL, an external VCO in addition to an RF integrated circuit, a power amplifier, and a front end are used. The circuit does not require an expensive and external high frequency filter such as a surface acoustic wave (SAW) filter or the like.

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